REMARKS

I. General

Claims 1-37 were pending in the present application, and all of the pending claims are rejected in the current Office Action (mailed July 27, 2006). The outstanding issues raised in the current Office Action are:

- Claims 1-37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,775,692 issued to Albert et al (hereinafter "*Albert*") in view of U.S. Patent No. 5,774,660 issued to Brendel et al. (hereinafter "*Brendel*").

In response, Applicant respectfully traverses the outstanding claim rejections, and requests reconsideration and withdrawal thereof in light of the remarks presented herein.

II. Rejections Under 35 U.S.C. §103(a) over *Albert* in view of *Brendel*

All of claims 1-37 were previously rejected in a Final Office Action mailed April 20, 2005 as being anticipated under 35 U.S.C. § 102(e) by *Albert*. In response, Applicant appealed the rejection to the Board and submitted an Appeal Brief presenting arguments regarding why the claims are not anticipated by *Albert*. In response to the Appeal Brief, the Examiner has reopened prosecution and now rejects the claims as being unpatentable over *Albert* in view of *Brendel*. Applicant respectfully submits that *Brendel* does not cure the deficiencies of *Albert* for the reasons discussed below. In particular, *Brendel* is discussed in the Background section of the present application (*see* page 5, line 25 – page 6, line 12 of the present application) and is noted as disclosing an inefficient mechanism for transferring TCP states that requires use of a proprietary protocol that is known only to the application level, which embodiments of the present invention overcome. Thus, for the reasons discussed further below, the combination of *Brendel* with *Albert* fails to render the claims unpatentable. As such, Applicant respectfully requests that the rejections be withdrawn and this application be passed to allowance.

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To establish a prima facie case of obviousness, three basic criteria must be met. *See* M.P.E.P. § 2143. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the applied references must teach or suggest all the claim limitations. Without conceding any other criteria, the applied references fail to teach or suggest all elements of the claims.

Independent Claim 1

Independent claim 1 recites:

> In a communication network, a method of TCP state migration comprising the steps of:
> a) establishing a TCP/IP communication session between a client computer and a first server computer, said first server computer part of a plurality of server computers forming a web cluster containing information, said communication session established for the transfer of data contained within said information;
> b) handing off said communication session to a selected server computer from said first server computer over a persistent control channel using TCP handoff modules that are dynamically loadable within TCP/IP stacks in operating systems located at both said first server computer and said selected server computer, that implement a TCP handoff protocol that works within kernel levels of an existing TCP/IP protocol; and
> c) migrating a first TCP state of said first server computer to said selected server computer, and a second TCP state of said selected server computer to said first server computer over said control channel. (Emphasis added).

The combination of *Albert* and *Brendel* fails to teach or suggest all elements of independent claim 1. For the reasons discussed further in the Appeal Brief of January 5, 2006, *Albert* fails to disclose at least:

A) TCP handoff modules that are dynamically loadable within TCP/IP stacks in operating systems located at both said first server computer and said selected server computer;

B) handing off said communication session; and

C) a persistent control channel.

The current Office Action appears to concede that *Albert* fails to teach or suggest "b) handing off said communication session to a selected server computer from said first server computer over a persistent control channel using TCP handoff modules that are dynamically loadable within TCP/IP stacks in operating systems located at both said first server computer and said selected server computer, that implement a TCP handoff protocol that works within kernel levels of an existing TCP/IP protocol", *see* page 3 of the Office Action. However, the Office Action asserts that *Brendel* discloses this element of the claim. Applicant respectfully disagrees, as discussed below.

The present application briefly discusses *Brendel* at page 5, line 25 – page 6, line 12 as follows:

> Previously, various mechanisms for transferring TCP states were implemented, including using a separate proprietary protocol at the application layer of an operating system. For example, in the Brendel et al. patent (U.S. 5,774,660), incoming packets to the front-end node have their protocol changed from TCP/IP protocol to a non-TCP/IP standard that is only understood by the proprietary protocol located at the application layer. Later, the packets are changed back to the TCP/IP protocol for transmission to the back-end web server. Thus, the Brendel et al. patent reduces processing efficiency by switching back and forth between the user-level and kernel level layers of the operating system.

> Thus, a need exists for a more efficient design for implementing a mechanism for transferring TCP states in a web server cluster.

Thus, the present application expressly recognized that *Brendel* fails to provide TCP handoff modules within TCP/IP stacks in operating systems that implement a TCP handoff protocol that works within kernel levels of an existing TCP/IP protocol. Instead, *Brendel* requires that incoming packets be changed into a proprietary protocol that is understood only at the application layer. For instance, *Brendel* explains at col. 13, lines 40-46 thereof:

> Modified TCP/IP stack 82 contains the standard TCP and IP modules with some modifications explained later. One modification is that incoming packets from the Internet have their protocol changed from TCP to a proprietary "IXP" protocol. Since this IXP protocol is unknown to the standard TCP and IP layers, it is sent directly up to application layer 80 containing the load balancer.

Thus, *Brendel* appears to disclose a system in which the TCP/IP stack of an operating system is modified so as to change incoming packets from the TCP protocol to a proprietary protocol that is understood only at the application layer, rather than implementing TCP handoff modules within the TCP/IP stack to implement a TCP handoff protocol as recited by claim 1.

Thus, for at least the above reasons, the combination of *Albert* and *Brendel* fails to teach or suggest all elements of claim 1. As such, the rejection of claim 1 should be withdrawn, and claim 1 should be passed to allowance.

Independent Claim 11

Independent claim 11 recites:

> In a communication network, a method of TCP state migration comprising the steps of:
> a)   establishing a TCP/IP communication session between a client computer and a first server computer, said first server computer part of a plurality of server computers forming a web cluster containing information, said communication session established for the transfer of data contained within said information;
> b)   monitoring traffic associated with establishing said TCP/IP communication session to understand a first initial TCP state of said first server computer associated with said TCP/IP communication session, at a first bottom-TCP (BTCP) module at said first server computer;
> c)   receiving a web request associated with said TCP/IP communication session at said first BTCP module at said first server computer;
> d)   examining content of said web request;
> e)   determining which of said plurality of server computers, a selected server computer, can best process said web request, based on said content;
> f)   handing off said communication session to said selected server computer from said first server computer over a persistent control channel, if said selected server computer is not said first server computer;
> g)   monitoring traffic associated with handing off said TCP/IP communication session to understand a second initial TCP state of said selected server computer associated with said TCP/IP communication session, at a second BTCP module at said selected server computer;
> h)   migrating said first initial TCP state to said selected server computer over said control channel, such that said second BTCP module can calculate a first TCP state for said first server computer in said TCP/IP

communication session;

     i)   sending a second initial TCP state of said selected server computer to said first BTCP module, such that said first BTCP module can calculate a second TCP state for said selected server computer in said TCP/IP communication session;

     j)   forwarding data packets received at said first BTCP module from said client to said selected server computer, by changing said data packets to reflect said second TCP state and a second IP address of said selected server computer;

     k)   sending response packets from said selected server computer directly to said client computer by changing said response packets to reflect said first TCP state and a first IP address of said first server computer; and

     l)   terminating said TCP/IP communication session at said first server computer when said TCP/IP communication session is closed.

The combination of *Albert* and *Brendel* fails to teach or suggest all elements of independent claim 11. As discussed further in the Appeal Brief of January 5, 2006, *Albert* fails to disclose at least:

A) a first bottom-TCP (BTCP) module at said first server computer, and a second BTCP module at said selected server computer;

B) examining content of said web request and determining which of said plurality of server computers, a selected server computer, can best process said web request, based on said content;

C) sending response packets from said selected server computer directly to said client computer;

D) handing off said communication session; and

E) a persistent control channel.

Further, *Brendel* fails to teach or suggest at least a first bottom-TCP (BTCP) module at said first server computer, and a second BTCP module at said selected server computer, as recited by claim 11. For instance, as discussed above with claim 1, *Brendel* does not teach or suggest any such BTCP modules, but instead appears to disclose a modified TCP/IP stack that changes an incoming packet's protocol to a proprietary protocol that is unknown to the TCP/IP stack for handling at the application level.

Thus, for at least the above reasons, the combination of *Albert* and *Brendel* fails to teach or suggest all elements of claim 11. As such, the rejection of claim 11 should be withdrawn, and claim 11 should be passed to allowance.

Independent Claim 26

Independent claim 26 recites:

> A server computer comprising:
> an upper TCP (UTCP) module located above a TCP module in an operating system of said server computer;
> a bottom TCP (BTCP) module located below said TCP module, said UTCP, TCP, and BTCP modules implementing a method of handing off a communication session between a first node and second node in a cluster network that works within the kernel level of an existing TCP/IP protocol, by migrating TCP states associated with said first and second nodes.

The combination of *Albert* and *Brendel* fails to teach or suggest all elements of independent claim 26. As discussed further in the Appeal Brief of January 5, 2006, *Albert* fails to disclose the recited UTCP and BTCP modules.

Further, *Brendel* fails to teach or suggest the UTCP and BTCP modules. For example, *Brendel* does not teach or suggest UTCP, TCP, and BTCP modules that implement a method of handing off a communication session between a first node and second node in a cluster network that works within the kernel level of an existing TCP/IP protocol, as recited by claim 26. For instance, as discussed above with claim 1, *Brendel* does not teach or suggest any such modules that implement handing off a communication session that works within the kernel level of an existing TCP/IP protocol, but instead appears to disclose a modified TCP/IP stack that changes an incoming packet's protocol to a proprietary protocol that is unknown to the TCP/IP stack for handling at the application level.

Thus, for at least the above reasons, the combination of *Albert* and *Brendel* fails to teach or suggest all elements of claim 26. As such, the rejection of claim 26 should be withdrawn, and claim 26 should be passed to allowance.
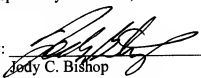
Dependent Claims

In view of the above, Applicant respectfully submits that independent claims 1, 11, and 26 are not unpatentable under 35 U.S.C. § 103 over *Albert* in view of *Brendel*. Further, each of dependent claims 2-10, 12-25, and 27-37 depend either directly or indirectly from one of independent claims 1, 11, and 26, and thus inherit all limitations of the respective independent claim from which they depend. It is respectfully submitted that dependent claims 2-10, 12-25, and 27-37 are allowable not only because of their dependency from their respective independent claims for the reasons discussed above, but also in view of their novel claim features (which both narrow the scope of the particular claims and compel a broader interpretation of the respective base claim from which they depend).

III. Conclusion

In view of the above, Applicant believes the pending application is in condition for allowance. Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-2025, under Order No. 10010812-1 from which the undersigned is authorized to draw.

Respectfully submitted,

By: _____

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